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# ARROWHEAD

COMBAT DEVELOPMENTS COMMAND

March 1973



**FINAL ISSUE**



# CDC





## Commander's Call

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# Yesterday's Accomplishments— Tomorrow's Tasks

This month marks a milestone in the history of combat developments. It is a time of organizational transition for us in Combat Developments Command and also a time when our Army is moving in new directions. At such a juncture, our mission to insure the best possible fighting effectiveness of our future Army becomes increasingly important.

Looking back to 1962 we know that CDC was born of a need for a single organization to look after our Army's future and to manage its burgeoning developmental activities. I believe that it has served that need well—contributing to the well-being of our Army both in war and in peace. CDC has shown conclusively that you cannot look at the parts of the combat development process in isolation. How we organize, how we equip, and how we fight are inseparables which must be managed by a single, dedicated organization—whether we are considering the short, mid, or long range periods.

We can be proud of our accomplishments. We have had to *foresee*. To that end, we have gathered a team of men and women, military and civilian, with the vision, the professionalism and the sense of urgency required to look into our Army's future, ask the "gut" questions and develop the tools to provide a clearer definition of that future. We have had to *analyze*. Taking a look at the long range time period, our work on LCS-1 has provided Army planners with a carefully considered framework for exploiting



new technology and determining how the Army should look in the 1990's. In the mid-range, our CONAF study has provided a new methodology for force planning under resource constraints. Other studies covering such varied areas as intelligence, small arms, artillery, air defense, tactical nuclear concepts, tactical communications, tactical wheel vehicles, the family of observation, scout and attack helicopters, field container systems, aircraft refueling and rearming, rapid integrated logistics and person-



nel support systems have provided a solid, carefully considered base for important decisions concerning how our future Army will fight, be equipped and organized. At the same time, we have strengthened our ORSA capability and computer capacity to help us in all combat developments tasks. We have had to *experiment*. In this growing field, we have explored new developments in air mobility, anti-tank systems, tactical operations systems, staff organizations and procedures, intelligence systems, automatic communications; night operations, air space utilization; and the newest applications of laser technology. We have widened our field of knowledge through these experiments, as well as joint ventures, all designed to provide valuable information to the decision makers. Our interests have become worldwide through a highly qualified briefing team and a hard working, dedicated group of liaison officers. Their reports have provided valuable information on trends and requirements of the Army in the field and on important on-going developmental activities.

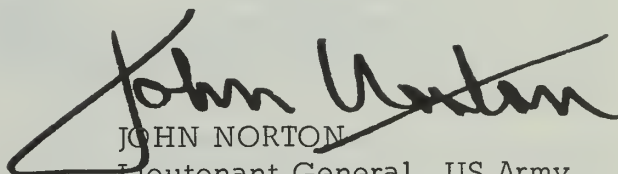
All of this effort has been aimed toward making recommendations: for new doctrine extending from the Soldier as a prisoner of war to nuclear concepts; for new organizations from the rifle squad to the TRICAP division; and for new materiel requirements from a forklift to a new main battle tank. Evident in the wide range of these accomplishments is the immense complexity of mapping our Army's future.

Therein lies the scope of the task before our Army as a whole. Looking ahead, our new Army team must work harder toward the dual goals

of modernization and "conliferation." It must move and keep combat developments ahead of mushrooming technological developments. It must "place man on top of the machine."

In the present critical transition period it is our special charge—those of us on today's combat developments "battlefield"—to maintain the momentum of our work and be sure that current priority actions, vital to the continual improvement of our Army, are carried forward in the new organization. Keep moving forward with the "vision" and the "CD process." Inspire and fire others with imagination and vigor to join you.

I am proud to have served with you on the Combat Developments Team. Your initiative, hard work, and sacrifices—to develop a better Army in the Field and to give our individual Soldier the best odds to win and survive on tomorrow's battlefield—have provided me the most rewarding experience in my thirty-six years of military service. I wish each of you all the best in the future.

  
JOHN NORTON  
Lieutenant General, US Army  
Commanding

March 1973

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# Letters From Group Commanders



DEPARTMENT OF THE ARMY  
UNITED STATES ARMY COMBAT DEVELOPMENTS COMMAND  
STRATEGIC STUDIES INSTITUTE  
CARLISLE BARRACKS, PENNSYLVANIA 17013

IN REPLY REFER TO:

CDCSSI-Z

31 January 1973

SUBJECT: Reorganization of USACDCSSI and the US Army War College

Members of USACDC Strategic Studies Institute

1. The Institute was formed in 1962 by separating the Doctrine and Studies Division of the US Army War College from the College to create the Institute of Advanced Studies. The Institute produced strategic studies, environmental forecasts, and until 1969 had responsibility for development of the CDC basic concept studies. With the reorganization of CDC, the Institute was formally redesignated the Strategic Studies Institute in 1971 and its mission was refined to that of producing strategy and related studies.
2. Since its inception as a separate entity, the Institute has worked primarily for DA staff agencies--principally the Office of the Deputy Chief of Staff for Military Operations (ODCSOPS). Throughout its existence the Institute has shared a common facility with the Army War College and close substantive relationships have existed between the faculty and students and the Institute's personnel.
3. Throughout its separate existence, the Institute produced over 50 major studies and contributed to scores of other CDC and DA efforts. The dedication and effort of past and present military and civilian members has always been of the highest level as is reflected in the acceptance and praise of the Institute work and in the increasing complexity and importance of issues assigned for study.
4. In this reorganization of the Army in 1973, the Institute returns to the Army War College as a major integral department. The Institute will retain its name and continue to prepare strategic studies for DA staff agencies, will establish an Environmental Forecast Group and an Advanced Analysis Group, and will increase in size. The combination of the College and the Institute is one further step toward closer integration of policy planning and the preparation of senior officers to execute policy in high level assignments.
5. The transfer of the Institute from CDC to the War College is therefore not a break with tradition but a continuity. It represents recognition of the valuable work of the Institute and the expectation of continuance of that tradition in the future.

*Franklin M. Davis, Jr.*  
FRANKLIN M. DAVIS, JR.  
Major General, USA  
Commanding





DEPARTMENT OF THE ARMY  
HEADQUARTERS  
U.S. ARMY COMBAT DEVELOPMENTS EXPERIMENTATION COMMAND  
OFFICE OF THE COMMANDING GENERAL  
FORT ORD, CALIFORNIA 93941

CDCEC-CG

15 February 1973

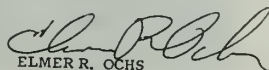
TO THE MEN AND WOMEN OF THE COMBAT DEVELOPMENTS COMMAND

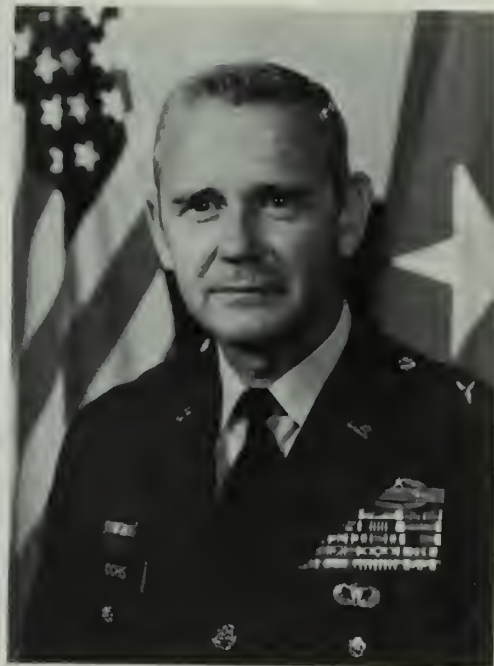
Once again we find ourselves at an important crossroads.

There is a tendency on occasions such as these to reflect -- often at the expense of future aspirations -- solely upon our past achievements. But the men and women of this command are accustomed to looking forward as well as drawing upon the experiences of the past.

While names and organizations may change, those of us at CDEC look forward to the continuance of our close working relationship with other members of the Combat Developments Family.

May your future be as personally rewarding as the past.

  
ELMER R. OCHS  
Brigadier General, USA  
Commanding



DEPARTMENT OF THE ARMY  
HEADQUARTERS  
U.S. ARMY COMBAT DEVELOPMENTS COMMAND  
COMBAT SYSTEMS GROUP  
FORT LEAVENWORTH, KANSAS 66027

IN REPLY REFER TO:

CDCCOMSCG

12 February 1973

TO THE MEN AND WOMEN OF COMBAT SYSTEMS GROUP

Since the inception of the US Army Combat Developments Command in 1962, Fort Leavenworth has played a major role in helping design the Army of the future. Initially formed as the Combined Arms Group, the intervening years brought several changes in organization, name, and scope of missions. Regardless of the name, the members of this organization, past and present, have played a pivotal role in the combat development process.

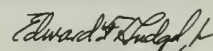
Recent years have seen Combat Systems Group assume an even more prominent role. Associated with the increased scope of responsibility has been a parallel growth in personnel strength. It has been the outstanding performance of these personnel, military and civilian, and their devotion to duty that have contributed so significantly to the many achievements attained.

The current reorganization will result in the merger of Combat Developments Command with CONARC to form a new major command, the Training and Doctrine Command. Combat Systems Group becomes a part of that command by forming the nucleus of a new organization--the Combined Arms Combat Development Activity. As a major subordinate element of the newly formed Combined Arms Center at Fort Leavenworth it will continue to focus on the needs of the Army in the field.

Inherent in any reorganization of such magnitude is the opportunity to make great strides. We welcome the increased responsibilities that will come to us from INCS Group, CONFOR Group, and the Systems Analysis Group and look forward to new talent joining our ranks of high caliber dedicated professionals. I am confident that the members of CACDA will respond to the new challenges.

I commend each of you for the splendid manner you have responded to past challenges and extend my sincere thanks to you for your outstanding performance and dedication. You can justly take pride in your past efforts. I am convinced that your future accomplishments will be of the same high quality for which you can continue to be proud and from which the US Army and our country will continue to be the beneficiaries.

Sincerely,

  
EDWARD F. GUDGEL, JR.  
Brigadier General, USA  
Commanding







DEPARTMENT OF THE ARMY  
HEADQUARTERS  
UNITED STATES ARMY COMBAT DEVELOPMENTS COMMAND  
PERSONNEL AND LOGISTICS SYSTEMS GROUP  
FORT LEE, VIRGINIA 23801

13 February 1973

GENERAL BOYES' FAREWELL TO PERSONNEL

Although CDC will no longer exist as a separate organization under the current Army realignment, the combat developments process and functions will continue. With this in mind, we the combat developers will still have to provide the Department of the Army with the answers to the following critical questions: How can the Army best fight, be equipped, supported and organized to insure that the Army, both for the present and future, extracts the greatest capability from its available and projected resources.

Changes never come easily, but we must keep in step with both technological advances as well as development in the real world if we are to provide the right answers to the above questions.

Besides continuing to perform the logistics missions and functions as presently assigned to PALSG, the new Logistics Center will increase its scope of operation to include systems design responsibility, an expanded operational research/systems analysis capability, war gaming capability, command and control of the LOGEX Planning Group, training, education and logistics career development responsibility, as well as having an in-house study capability.

The combat developments process is a continuing program and at present I feel we are only pausing before we strike out again with new and better combat developments methods for achieving our goals.

It has been my privilege to have had PALSG as my first command as a General Officer. I know each member of the Group, whether military or civilian, will accept the challenges of the future with the same determination.

Again, thank you for your support and great "can do" attitude which made the personnel at CDCPALSG the great contributors they have been and will be in the future with the Logistics Center.

*John H. Boyes*  
JOHN H. BOYES  
Brigadier General, USA  
Commanding



DEPARTMENT OF THE ARMY  
HEADQUARTERS  
USACDC INTELLIGENCE AND CONTROL SYSTEMS GROUP  
FORT BELVOIR, VIRGINIA 22060

IN REPLY REFER TO:  
CDCINCSG

14 February 1973

All Personnel  
US Army Combat Developments Command  
Intelligence and Control Systems Group  
Fort Belvoir, Virginia 22060

With the Army's major reorganization designed to modernize, reorient, and streamline the Army, the Intelligence and Control Systems Group will be discontinued and responsibilities transferred to those organizations which will comprise the new combat developments community. The efforts of the personnel of this Group have contributed significantly to our mission of insuring the orderly and timely development of intelligence and control systems for the Army in the field. Although the Group has existed only 2 years, we have led the way in developing such important projects as the Integrated Battlefield Control System, Army Tactical Data Systems, improved communications systems, and intelligence and electronic warfare programs. These programs and systems will have far-reaching effects on the Army's capabilities in the future. I am proud to have been associated with an organization that has had such a vital role, and which has been staffed by such outstanding and dedicated people. I now call upon you to join in a united effort to strengthen the Army and gear it more precisely to the challenges of the future. I wish you all the best in your new assignments.

*F. B. Hodson, Jr.*  
F. B. HODSON, JR.  
Brigadier General, USA  
Commanding



DEPARTMENT OF THE ARMY  
UNITED STATES ARMY COMBAT DEVELOPMENTS COMMAND  
SYSTEMS ANALYSIS GROUP  
FORT BELVOIR, VIRGINIA 22060

CDCSAG-CO

14 FEB 1973

SUBJECT: Best Wishes

All Members of the Systems Analysis Group

1. As the final chapter in the short history of the Systems Analysis Group draws near, I would like to take this opportunity to express my appreciation to all the fine members, both present and past, who have assisted so diligently in the outstanding contributions we have made to the Army's combat development process.

2. Since its inception as the USACDC Institute of Systems Analysis on 1 October 1967, the Systems Analysis Group has grown from a small handful of scientific and professional personnel with one or two clerks to a full blown organization ready to provide all of the disciplines required to take on the challenge of any type of operations research/systems analysis endeavor---no matter how large or how small---and see it through to its successful completion. Although it has suffered its fair share of growing pains which are attendant to any expanding organization, the Group has left its indelible mark on the minds of those who have learned to understand and appreciate what our services have meant to the success of their studies. Our role may have been only that of supporting or consulting, but it certainly has spiraled in importance and magnitude to gigantic proportions and has had great impact on the successful fulfillment of the Combat Developments Command's mission.

3. Systems Analysis Group's accomplishments, too numerous to describe here, are but reflections of the individual achievements of its assigned personnel; military, civilian, scientific, technical and administrative... some of the most talented and dedicated persons with whom I have ever been associated.

4. As a result of the current Army Reorganization, with its inherent creation of new organizations and discontinuance of some of the old ones, many of our personnel will depart for new jobs and new challenges, I'm confident that the professionalism that has provided you successes in the past will make you equal to the challenges of the future. God bless you.

*H. J. Childress, Jr.*  
H. J. CHILDRESS, JR.  
Colonel, ADA  
Commanding



DEPARTMENT OF THE ARMY  
USACDC, HQ CONCEPTS AND FORCE DESIGN GROUP  
2461 EISENHOWER AVENUE  
ALEXANDRIA, VIRGINIA 22314

15 February 1973



TO: THE MEMBERS OF USACDC CONCEPTS AND FORCE DESIGN GROUP

Personally, and in behalf of former commanders, I thank you for the support you have given our United States Army and the combat developments process. You completed a unique long range study, the Land Combat System for Operations in the 1990s. It has been sent to the Chief of Staff, Army. The second iteration of the Conceptual Design for the Army in the Field study is nearing completion. These two major studies could play a significant role in shaping our Army of the future.

As Concepts and Force Design Group, we have completed more than 40 major actions and supervised the completion of nearly 20 more by our two agencies. Our residual responsibilities are being transferred to those organizations which will comprise the new combat developments community.

The Special Operations Agency and the Nuclear Agency can be especially proud of their support of the Army in the Field. Their important work will, of course, continue under new management.

We can all take pride in our accomplishments. As we go our separate ways to face new challenges in new assignments, I wish each of you the best.

*Otis C. Lynn*  
OTIS C. LYNN  
Brigadier General, USA  
Commanding

April 1973

## A Philosophical Farewell . . .

# CDC—Hundreds of Acronyms Later

by Bill Herman

Is that to be the legacy that Combat Developments Command leaves the Army?

Just another AGP—Acronym Generating Point?

While “unique” has been the most-used word in attempting a description of CDC, “challenging/frustrating” has been the principal emotion generated by most writers making the attempt. Thus this writer, with a compulsive affection for the Army, and who has tried for ten years to describe what CDC *is*, now makes a final attempt to explain what *was*.

And not use the word “unique?”

But could you call it “un-unique,” this polyglot of people whose principal duty was to *doubt*? To doubt that the Army in the field was doing its best job; that the Soldier himself was performing to his full capabilities?

That’s what CDC’s people have been doing for the past ten years or more.

They doubted—and did something about it. This was manifest in the tactics, techniques and systems that appeared in Vietnam from the earliest, crudest perimeter warning systems to electronically “sensitizing” a whole battle zone.

It somehow seems poetically just that CDC and the “modernized” Vietnam war come to a close almost simultaneously. Why not? They

were practically born together in ’62. Many of the desk and office ornaments noted around CDC that summer were Viet Cong cross-bows, punji sticks and native pipes. The VC were not on the CDC staff—but their existence was very real.

And from there began a strange kind of “mind-to-mind” warfare, with one Army getting more and more technological, the other getting more frustratingly primitive. After some years of this, there were some who said we might not be out-fought, we might be “out-simplified”; that we might even “modernize our way to defeat.”

Well, that didn’t happen, and CDC was one of the reasons why. Many of the still “battle-cruddy” at CDC would have liked to give the Vietnam-bound Soldier everything he could possibly use (or carry!), but they were also under obligation to be realistic about combat effectiveness. CDC’s mission was victory, same as the Army’s, but it was also given the task of putting the “doctrinal brakes” on developments and to keep the system orderly. Emphasis was on recommending development of items and systems because the Soldier *needed* them, not merely because industry could *build* them. So CDC’s work started and ended with the User—a sometimes predictable composite of latent talents and limitations. In designing a “human-oriented



Army," CDC first set about visualizing how an "idealized" Army should be employed, which human traits were to be improved upon, which to be neutralized. Then came the task of marrying-up the people and things to make a successful fighting force—and verifying that it was the right combination to make a proper marriage.

Perhaps the most striking example of the whole CDC process is the Airmobile Division. So much doctrinal, materiel and organizational development effort went into this endeavor, from the time of the Howze Board (Tactical Mobility) studies, that the First Cavalry might today be called a monument to CDC and the spirit of innovative thinking.

This is especially true since the Division is *still* under development today as forerunner of divisions yet to come, to meet challenges yet to be identified.

Why did all these great things start happening in the '60s? Wasn't anybody thinking before CDC got the job? Many were, and hard, too—but in a narrow plane. The Army's best skull-sessions often took place in the service schools; in the caustic comraderie of classroom work-sessions or in intellectual assaults in the staff and faculty pits. The good thinking that was accidentally retained generally could be called "tunnel vision" because it pertained almost parochially and exclusively to a single branch or arm. CDC was created to harness these narrow bands of thinking—in effect to "laminate" them into a track leading to improving combat effectiveness by viewing the Army as a total, integrated combat system.

This CDC set upon doing with its initial program of "packaged Armies"—called Army-75, Army-80, Army-90, until the view-finder got too cloudy. From there CDC's "idea management" went to more precise, computerized formats, evolving into today's "Force Design," if such a complex activity must be generally named. And complex it is, too, since it looks at the Army in its largest and smallest details—at the Army's tons—and *ounces*.

Now all that is to become history. And like a lot of history, it's a story that never quite gets fully told. As a command, CDC was distinctly one-of-a-kind, but as a function it was judged to be both a trade and an art with its genesis deep in history. Since the classic wars,



Brochures were used extensively to inform friends—and critics—of CDC's role in the "philosophical realm" of the developments cycle. Here is one of the earliest themes used.

every army seems to have had a group watching the battle from a nearby hill (symbolically) and perhaps saying "we could have done that better."

Although today we may call some of them "journalists," they were really the earliest combat developers. They have always been with us, these "cynics and critics" of the military art, and they have always been welcome; troublesome at times, but welcome. They are the dedi-

continued on page 10

The Future

Begins

TODAY

HOW SHOULD THE ARMY FIGHT

?

HOW SHOULD THE ARMY BE EQUIPPED

?

HOW SHOULD THE ARMY BE ORGANIZED

?

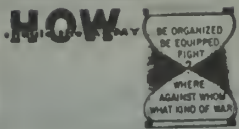
ARMY 85

to Victory"

Besides acronyms, CDC employed many slogans, displays, phrases and catchwords to help tell its complex story. Some are shown for the last time on these pages. The famous Three Questions of CDC went through periodic change, mostly in the order of appearance of "Fight-Equip-Organize" (It's now "How should the Army Fight and Support?") Even the command's motto "Vision to Victory" was adapted from the original contest winner in order to make it fit on the CDC shoulder crest.

TODAY





# MY ARM 1570

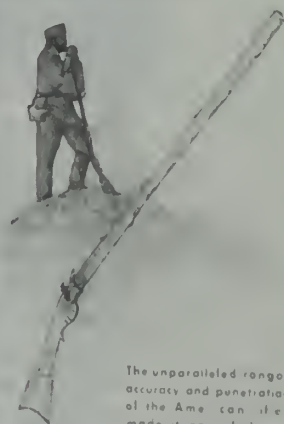
MILITARY HISTORY  
INDICATES THAT  
THE ESSENTIAL  
INGREDIENTS FOR  
VICTORY ON THE  
BATTLEFIELD ARE  
SUPERIORITY IN  
COMBAT TECHNIQUES,  
EQUIPMENT AND  
ORGANIZATION.



General George Crook's  
unconventional tactics in  
his post Civil War Indian  
campaigns featured winter  
patrols, loose formations  
and irregular battle dress.



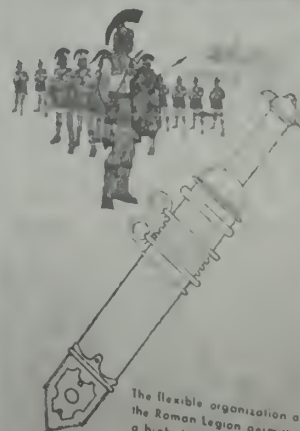
English foot soldiers stopped  
the French cavalry during  
the Battle of Crecy in 1346  
with a revolutionary new  
weapon: the longbow.



The unparalleled range  
accuracy and penetration  
of the American rifle  
made it one of the  
deciding factors in the  
Revolutionary War.



The Greeks found the  
phalanx, a shoulder-to-  
shoulder formation to  
be a superior type of  
battlefield organization.



The flexible organization of  
the Roman Legion permitted  
a high degree of mobility  
while still preserving the  
close rank discipline of  
the Greek phalanx.

Prior to the contest which produced the motto, an imaginative general officer had his favorite slogan emblazoned over the headquarters lobby and above the conference room stage. It read "Someone Has to Fight!" and fight we did, fending off questions from the rest of the staff, then the media and eventually a federal agency, who somehow got wind of it and got word into Army channels that they considered the phrase "too war-like." It was removed-- still unexplained.

## VISION — TOMORROW'S VICTORY





The CDC arrow-and-star insignia had its genesis in a contest in 1962, with most of the entries coming from the then-CONARC Combat Developments Center. Thus the recurrence of the (red-white and blue) CONARC disk, as noted in these samples. A strong play is also given the palladin-knight, the chess-board and the torch-of-learning. Many promising designs were rejected because the acronym for Army Combat Developments Command—AC-DC—made them too “current”.

cated, experienced men who know when to go for the temporary relief of a modification or quick-fix, and when to go for a brand new beginning. Their most outstanding trait is *courage*, but a special kind—the kind of courage it takes to face a new *idea* without panic.

These people (lately called “resources”) are not being lost to the Army. The combat developments mission isn’t being abandoned or even modified—it’s merely going through a location and name change. For the branch-wise agencies, they will rejuvenate themselves through their return to the familiar environment of their branch schools.

The mid-management Groups add their specialized talents to the Functional Centers’ combat developments where they will play a “heavy” role (a Bad Guy in a White Hat?).

CDC’s headquarters goes through its own special metamorphosis. Its present staff reconfiguration at Fort Belvoir into Deputy Chief of Staff for Combat Developments is as it will

appear at TRADOC, Fort Monroe. It is, in fact, a “miniaturization,” but with very little change in mission.

Important also for the developments effort is the locating of the key developments “resources” at TRADOC, since TRADOC is itself a “miniaturization” of CONARC headquarters which directed the training of the key man in the developments cycle—the User.

So what has the organization accomplished? It has simply put the developer *and the User* in the same organization.

So CDC is not leaving the Army. Some say (CDC has its own cynics and critics) it was never in *this* Army—it was always thirty years away. But CDC will always be in the Army whenever a Soldier or citizen mutters “What the Army needs is . . .”

Therein is the legacy CDC leaves to the Army: it taught us to *listen* to new ideas—and to *each other*.

Good listening, CDC, wherever you are. 



DEPARTMENT OF THE ARMY  
HEADQUARTERS  
UNITED STATES ARMY COMBAT DEVELOPMENTS COMMAND  
FORT BELVOIR, VIRGINIA 22060

CDCCCCG-CSM

2 March 1973

TO: All Enlisted Men and Women of CDC

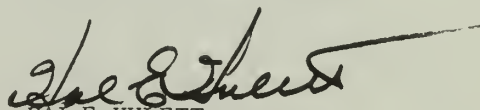
With the reorganization of the Army, many of you will be going to other assignments; some of you will be completing your active duty tour and returning to civilian jobs. As you leave the Combat Developments Command, you can take pride in the many accomplishments and contributions made by the enlisted personnel towards designing the Army of the Future.

In CDC the enlisted man took on a new role in the modern Army. Many of the senior NCOs found themselves taking an active part in designing new materiel and formulating new doctrine and organization. Senior Army planners recognized the valuable experiences and first hand knowledge of the enlisted men, and used this knowledge in many of the major projects of CDC. For the first time, enlisted personnel were taking an active part in our Army's research and development programs. The NCO symposia, initiated by CDC, showed that the enlisted men of the Army were more than just the backbone of the line unit.

Many of you were involved in testing new materiel and others were actively involved in the planning and analysis of new doctrine and organization. Your role has been vitally important to our Army. You have personally contributed to the Army of the Future. The symposia, the workshops, the field testing, and the staff studies in which many of you have been involved will help senior Army planners make sound decisions for the future of the Army.

The enlisted personnel of CDC have been privileged to serve in a Command that has been an integral part of the combat development process. Whatever you may do in your future assignments, your experiences in CDC will always be of value.

The capitalization of the word "Soldier" in CDC illustrates the importance of the enlisted personnel. I am proud to have served with such outstanding men and women. I salute you for a job extremely well done and extend best wishes for continued success.

  
HAL E. HULETT  
Command Sergeant Major

# CDC Past Commanders



**LTG John P. Daley**  
Jun 62–Jul 63

“CDC’s task is to find answers to three questions: How should the Army be Equipped? How should the Army be organized? How should the Army fight?”

“The need to keep doctrine and technology in balance is at the heart of the CDC mission. In the coming years, we can expect the scope and complexity of that mission to increase as scientific advances continue.”



**LTG Dwight E. Beach**  
Aug 63–May 65





**LTG Ben Harrell**  
May 65–Jun 67

“The challenge to CDC lies in insuring that our military forces have the benefit of the most thorough doctrinal thinking, the finest equipment and the most effective guidance for their use.”

“The combat Soldier’s battlefield needs for many years are being guided toward reality by the sure hands of professionals in the developments trade.”



**LTG Harry W. O. Kinnard**  
Jul 67–Aug 69

“Progress for the Army in the 70’s will come as a result of imaginative planning to guide the Army’s adjustment to complex trends in the nation and the world.”



**LTG George I. Forsythe**  
Sep 69–Oct 70

# On The Nature Of Things: Command and Control

by  
**Marvin J. Meyers**

I was watching television the other evening and to my surprise found a war drama on one of my favorite commercials. It seems that Mother Nature had taken on a new role as the overall commander (or should I say commandress) of a battle between the beasts of prey. I could not help but marvel at the unique approach she used in handling a most important aspect of any tactical operation—Command and Control.

The story unfolds around five rebellious bears who strayed from the community to deliberately defy the laws set down by Mother Nature. The bears had created mayhem leaving death and destruction in their wake as they pillaged and terrified the entire countryside.

The animal community was outraged. Mother Nature would handle the situation in her own way. It was apparent that the bears were in for some real trouble. With the wave of her



magic wand, Mother Nature summoned together an effective bear-defeating force. Her choice: elephants, as the prime ground maneuver unit; cheetahs, for ground scouting and surveillance; eagles, as the prime aerial maneuver unit; and falcons conducting the aerial surveillance mission.

The responsive terrain, independent mobility of the eagles and falcons, complemented the weather, independent mobility, inherent in the elephant and cheetah. All were capable of being concentrated from widely dispersed locations to a critical point, in time to engage the rampaging bears in decisive combat.

It would seem impossible that these four species, all communicating in different languages, could be assured of survivability and mission effectiveness; so, Mother Nature called them together to effect coordination and planning prior to mission execution. The result: simpler control, since all ground and aerial forces were able to relate in common terms. How? Maybe it was Mother Nature's magic wand. Or perhaps it was because all these forces were tuned in on the *command net*.

The falcons and cheetahs made visual contact with the enemy and reported to Mother Nature. She, in turn, summoned her ground maneuver force, complemented by the eagles, to stop the marauders. The cheetahs made physical contact, hitting and swiftly fleeing to the flanks. The bears, annoyed with these antagonists, began to pursue. On order, the eagles attacked, mauling and delaying its prey long enough for the elephants to plummet through. The bears were confused. Thinking they could rule the roost, they now turned chicken and fled. The elephants, on order, pressed this golden opportunity, and defeated the enemy in detail.

An outstanding display of military strategy, command and control, culminating in defeat of the enemy. Quite obviously—*"It is not nice to mess with Mother Nature."*

After this one minute commercial, I began to formulate some lessons learned that could realistically apply to our air/ground operations.

Command and control for us humans involves a little more than waving a wand and wearing a long crimson robe to summon and control our forces. (Doing such in combat may get you a long rest—even with pay.) Command, control, and communications had to be simple, direct, and responsive so as to afford Mother Nature (the overall commandress) the maximum flexibility in employing all her forces in decisive combat.

Regardless of how the forces were organized, Mother Nature (the ground commandress) had to have positive control of all elements of her force. It is the commander, with the responsibility of determining the priority of commitment, the risk involved, and the establishment of priorities, who must have direct and positive control of all maneuver units in his area of responsibility.

The eagles were integrated into the elephants' scheme of maneuver in the planning stage of the operation. This insured that the eagles' integration into the communications net of the elephants' forces would be accomplished without interruption or disruption of the force's combat mission. It insured positive control of the aerial assets by the overall force commandress, and provided the responsiveness to command required to realize the full potential of the aerial maneuver force in accomplishment of the mission.

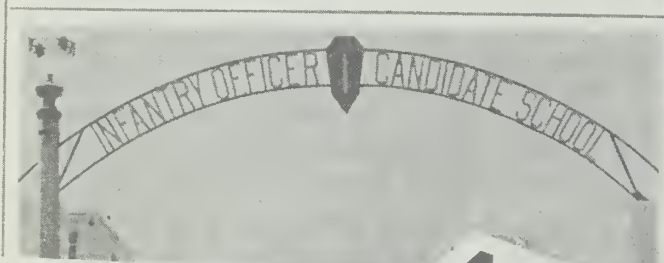
As was evident, this integration greatly increased the shock effort inherent in mobile warfare. The massed multi-dimensional assault by the aerial and ground maneuver forces, conducted aggressively and violently, effectively combined to destroy the enemy physically as well as psychologically.

I doubt if our television commercial writers intended to portray Mother Nature as a military strategist; however, to the military thinker the analogy to our present military doctrine is exciting and, surprisingly, doctrinally valid.

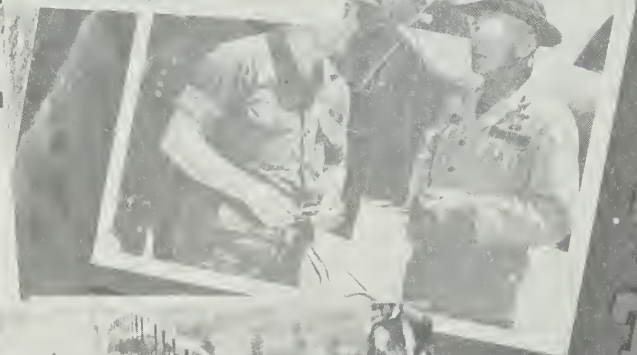
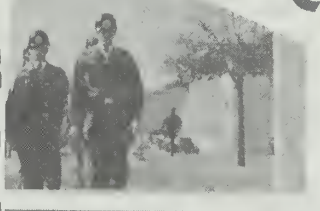
So the pen writes on, selling food for thought. By the way, that reminds me of another commercial where a pea is talking to the Jolly Green Giant . . . well, that's another story!



# TRI-CAP: NEW CHALLENGES FOR NEW LEADERS



# RIOT CONTROL: THE LAST RESORT



# CDC'S TACTICAL VEHICLE REVIEW BOARD PUTS THE SQUEEZE ON TOE'S

INTEGRATED BATTLEFIELD  
CONTROL SYSTEM

ARROWHEAD Reac

The Infantryman



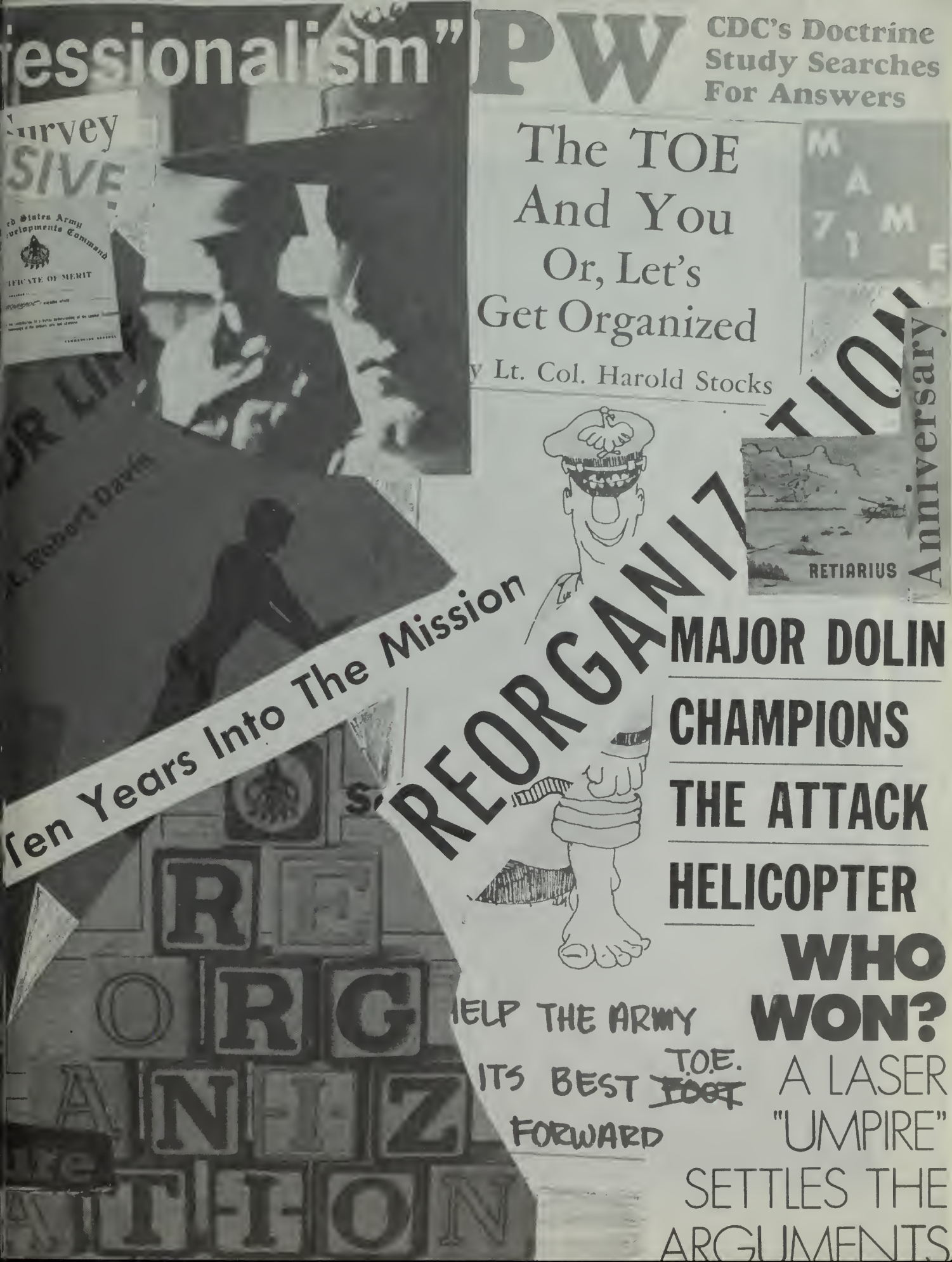
A Decade of Progress

medical... cool  
assurance of the combat  
Support Hospital, which he and  
a hand-picked staff of some  
40-plus medical specialists are  
field evaluating.

continued on page 19

Total  
Treatment  
ary Medicine  
Quiston

Armor  
Faces The Fu



Professionalism" PW

CDC's Doctrine Study Searches For Answers

Survey SIVE

ed States Army Development Command

IFICATE OF MERIT

THE TOE And You Or, Let's Get Organized

y Lt. Col. Harold Stocks

Anniversary

REORGANIZATION

MAJOR DOLIN CHAMPIONS THE ATTACK HELICOPTER WHO WON?

HELP THE ARMY ITS BEST TOE. FOOT FORWARD

A LASER "UMPIRE" SETTLES THE ARGUMENTS

ten Years Into The Mission

RETARIUS

OR LIT

Robert Davis

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# Commanders Conference-February 1973





FLASH . . . As the *Arrowhead* was going to press, we were notified that Mrs. Shellabarger was also chosen as the ARMY WIFE OF THE YEAR. Again, our congratulations to Mrs. Shellabarger.



MRS. SANDRA SHELLABARGER

CDC

## WIFE OF THE YEAR

Congratulations to Mrs. Sandra Shellabarger, the CDC Wife of the Year. Mrs. Shellabarger is the Wife of LTC Harold Shellabarger of Headquarters, CDC.

Mrs. Shellabarger, the mother of four children, devotes unlimited service to both the military and civilian communities. At Fort Belvoir, Va., Mrs. Shellabarger is active in the Officers' Wives' Club functions and in the Red Cross Volunteer program. Currently a member of the Fort Belvoir Commissary Advisory Board, Mrs. Shellabarger strives to improve the relationship between military personnel and the commissary staff, advising the staff about the patrons' needs and desires as they relate to the commissary store.

While living at Fort Lewis, Washington, she initiated the Budget Counselling Program as an extension of their Army Community Service program. With a civilian counterpart, Mrs. Shellabarger worked in assisting military families with their financial problems. The Budget Counselling Program that she began at Fort

Lewis was the forerunner of a more detailed program of wider scope that she organized at Fort Belvoir. While families are still counselled in proper budget managing techniques, Mrs. Shellabarger acts as the liaison between all civilian creditors and military personnel to open the lines of communication and help correct military indebtedness problems. This program, now enlarged to a full consumer help agency, under the direction of Mrs. Shellabarger, educates families in the "how to" of buying and in the proper use of credit.

Mrs. Shellabarger is also very active in the educational system in the Fort Belvoir area.

Mrs. Shellabarger's dedication to aiding the communities in which she has lived has brought her many awards and recognition. But Mrs. Shellabarger's real reward is in the form of knowing she is helping others to help themselves. Mrs. Shellabarger is a true example of the military wife who is involved in her community. Because of her unselfish and continued dedication to others, she has justly deserved the title of CDC Wife of the Year.

# FINALISTS COMS

## MRS. JO HUGHES



Mrs. Jo Wright Hughes, wife of Major James P. Hughes of the Infantry Agency, was selected as the Combat Systems Group Wife of the Year. Mrs. Hughes is active in church, civic, and social activities at Ft. Benning, Ga. She is Bible study leader for the Protestant Women of the Chapel and assistant adult Sunday School teacher at the Religious Education Center. The mother of four boys is a Cub Scout Den Mother and an active participant in the "Run For Your Life" program.

She is a Red Cross first aid instructor and active in the Officers' Wives' Club functions. In Albany, Ga., Mrs. Hughes wrote, produced and hosted a Children's television show, "Jo's Joyland". In this program she worked towards bettering the relations between the military and civilian communities.

# CDEC

## MRS. DEE THORNTON



Mrs. Dorcas (Dee) Ann Thornton, wife of Captain Harold E. Thornton of the Combat Developments Experimentation Command is the Combat Developments Experimentation Command Wife of the Year.

Mrs. Thornton is an active part of the Fort Ord community. She is a Cub Scout Den Mother, a school room mother and formerly served as a Teacher Aid. Mrs. Thornton has been an active member of the Officers' Wives' Club, serving as unit representative for Deputy Chief of Staff for Experimentation in 1971-1972. She is also President of the Protestant Women of the Chapel and writes a monthly newsletter for the Protestant Women of the Chapel. She also assists in writing the Fort Ord Community Service Center Newsletter.

Mrs. Thornton has two children. Her devotion to helping the military and civilian communities wherever she goes makes Dee Thornton an outstanding Military Wife.



# PALS

## MRS. JANE WALDO

Mrs. Jane M. Waldo, wife of LTC Rondel L. Waldo, is the Personnel and Logistics Systems Group Wife of the Year.

Mrs. Waldo has been an active part of the Officers' Wives' Clubs wherever she and her husband have been stationed. She has also been active in the Girl Scout program and organized the first Girl Scout Troop at Sharpe Army Depot, California.

Mrs. Waldo is also the President of the Catholic Women's Guild of Ft. Lee. Mrs. Waldo is active in the Red Cross Volunteer programs and rarely misses working with the Red Cross Blood-mobile. Mrs. Waldo has also done a great deal of substitute teaching at the various posts at which she has lived.

Mrs. Waldo's contributions make her a true representative of the Military Wife.



# SSI

## MRS. MAGGIE SLOMINSKI

Mrs. Maggie Adele Slominski, wife of Colonel Martin J. Slominski, is the Strategic Studies Institute Wife of the Year.

Mrs. Slominski is the civilian chairwoman of the Carlisle Barracks Army Community Service and worked as a Red Cross Volunteer until her last child was born. She has been active in Officers' Wives' Club functions and has been a volunteer at Emergency Hospital in Washington, D.C.

At Carlisle Barracks, Mrs. Slominski has been quite active in the Army Community Service activities. She has assisted families in gaining legal assistance, financial assistance, and housing assistance. She has also worked with families of our Prisoners of War and Missing in Action.

Mrs. Slominski's active participation in the Army Community Service activities makes her stand out as a Military Wife.







## CONFOR

### MRS. DOLORES MARAVIC

Mrs. Dolores Maravic, wife of Major Nicholas Maravic of the Special Operations Agency, is the Concepts and Force Design Group Wife of the Year.

Dolly Maravic is active in many programs at Ft. Bragg, N.C. As a voluntary member of the Ft. Bragg School Board, she has been actively involved in developing administrative policies. Mrs. Maravic is also active in the sports activities of the school. She assists in football, basketball, and baseball games.

Much of Mrs. Maravic's time is spent at the Ft. Bragg Thrift Shop. She is a member of the Thrift Shop's Board of Directors.

In addition to Mrs. Maravic's social and community activities, she serves as a Sunday School teacher and a volunteer on many youth oriented groups. Mrs. Maravic is certainly deserving of the title of CONFOR Group Military Wife of the Year.



## INCS

### MRS. FRANCES PLOOSTER

Mrs. Frances Plooster, wife of LTC Orin Plooster of the Communications-Electronics Agency, is the Intelligence and Control Systems Group Wife of the Year.

The mother of six children, Mrs. Plooster still finds ample time to devote to her community. She is an instructor in decoupage and has served as a Red Cross Volunteer in the Dental Program. As a decoupage instructor she has taught the art to many people on the post. The course has been so popular that a similar course will be started at the Adult Education Program at the local high school.

Mrs. Plooster also supports three PTA activities where her children attend school. She has served as a Girl Scout Cookie Chairman and has served in the Rosary Altar Society and other Church activities.

Mrs. Plooster's contributions to her community and her Church make her a fitting example of the Military Wife.

# Why Remotely Piloted Vehicles?

by  
**CPT Douglas James Bell**

At 0230 hours, LTC Brown, commanding the 1/69th Infantry, 3rd Brigade, 21st Infantry Division, is awakened by the rasp of the field telephone below his cot. Simultaneously placing the handset to his ear and groping for his boots, he hears the voice of his S3, Major Ready. "Sir, I'm in the TOC with the S2. He tells me that there's a company-size personnel concentration moving toward Alpha Company's 1st Platoon. Right now the hostiles are masked from our OPs by hill 1201, but the brigade RPV operating in our sector picked them up with infrared sensors." LTC Brown replies, "I'm on my way over," and begins the short trip to the TOC. On the way, he quickly reviews the situation. The 1/69th has been defending for the past three days, having come out of reserve to replace the 2/69th on the FEBA. Third brigade is consolidating its position, having successfully attacked to seize the division objective of a key pass controlling the approach to Nicksville. The 1/69th has prepared only hasty defenses, and lacks long-range observation due to the broken terrain in its sector. The enemy has taken advantage of darkness and bad weather to probe the line companies each night. LTC Brown realizes that the enemy is likely to counterattack in force soon to expel the 1/69th from its position.

Arriving at his Tactical Operations Center (TOC), LTC Brown is quickly briefed by Major Ready and the S2, Captain Nelson. Captain Nelson begins, "Sir, we've just heard from brigade again and they say there is movement in front of the 4/69th also. The movement to our front,

behind hill 1201, looks like a rifle company. The latest returns from the RPV show the hostiles approaching concentration Bravo-three. They are still masked from direct observation, so Alpha Company cannot see them with their radars or night observation devices. Also, you know that we were unable to utilize unattended ground sensors, due to their inability to obtain signals in this terrain."

Major Ready interjects, "Sir, I've got Alpha Company alerted to the situation, and have our 4 deuce mortar platoon standing by. I recommend taking the hostiles under fire as soon as the RPV shows them reaching concentration Bravo-three."

LTC Brown's analysis of the situation is that another enemy probe is about to be launched, or that the enemy is assembling for a limited objective attack; and so he concurs with his S3's recommendation. "O.K., Major Ready, and notify brigade TOC of our intentions. Alert the other companies to the situation, and have the direct support artillery standby. Get me a line to Captain Legg at Alpha Company."

Concurrent with the action that has alerted the 1/69th and the 3d brigade to a probable attack, staff officers at the 21st Division are analyzing sensor returns from a remotely piloted vehicle (RPV) which has detected an enemy armor battalion approaching Nicksville. Due to the distance and nature of the target, the division G3 does not believe that the enemy armor can be successfully engaged by division artillery. Darkness, bad weather, and the need for rapid

Cpt. Bell is assigned to the CDC Intelligence Agency,  
Ft. Huachuca, Ariz.



Teledyne Ryan Aeronautical's family of Firebee aerial targets and drone systems represent a wide spectrum of RPV configurations.

response preclude calling for tactical air support, so the G3 decides to recommend that the division commander expend one of his tactical nuclear weapons when the enemy armor concentrates in an assembly area.

In both of the situations just described, combat commanders were able to detect, recognize and locate hostile threats and apply firepower to neutralize these threats well before the enemy could move to a position from which he would be capable of engaging friendly forces. The capability to conduct such a timely and decisive combat action would be considerably enhanced by the deployment of a new family of Army aerial reconnaissance, surveillance and target acquisition vehicles—remotely piloted vehicles. When equipped with appropriate sensors with data link to a ground sensor terminal where rapid and accurate imagery interpretation would be conducted, the RPV would become a valuable addition to the combat intelligence collection system.

The Intelligence Agency is now evaluating numerous RPVs, as input to a study effort intended to form the basis for a systematic reconnaissance, surveillance and target acquisition capability. The goal is to provide forward echelon commanders with as much usable information as possible about the enemy, under all conditions of weather, visibility, and terrain. In order to achieve this goal, the Intelligence Agency recognizes a requirement for nearly continuous, broad area, long-range, all-weather, day/night coverage of the battlefield. Sensors and information dissemination systems must be capable of providing timely and accurate detection, recognition, and location of the enemy with target information being rapidly presented to the commander in a usable format. A particularly evident need for such information exists at division and lower echelons.

Obviously, no single reconnaissance, surveillance and target acquisition device is capable of providing such coverage. Each of our present





**The prototype Lockheed RTV-1 will be capable of employing photo, FLIR, or LLL TV and laser designator.**

sensor systems is limited by certain inherent characteristics, which state-of-the-art technological advances are not likely to overcome.

Ground-based sensor systems are generally limited by line-of-sight restrictions. As an example, the range capabilities of ground surveillance radars, night observation devices, and unattended ground sensors may all be restricted by terrain considerations. Line-of-sight restrictions on transmission of returns from unattended ground sensors may be overcome by airborne radio relay; but aircraft availability, bad weather, and enemy air defenses may all serve to restrict the use of airborne relay.

Foliage masking also limits the utility of most ground-based sensor systems. Advances in radar technology may succeed in providing a ground-based foliage penetration surveillance radar system; but line-of-sight restrictions will continue to limit the range of radars.

Adverse weather degrades our present ability to conduct both ground and aerial reconnais-

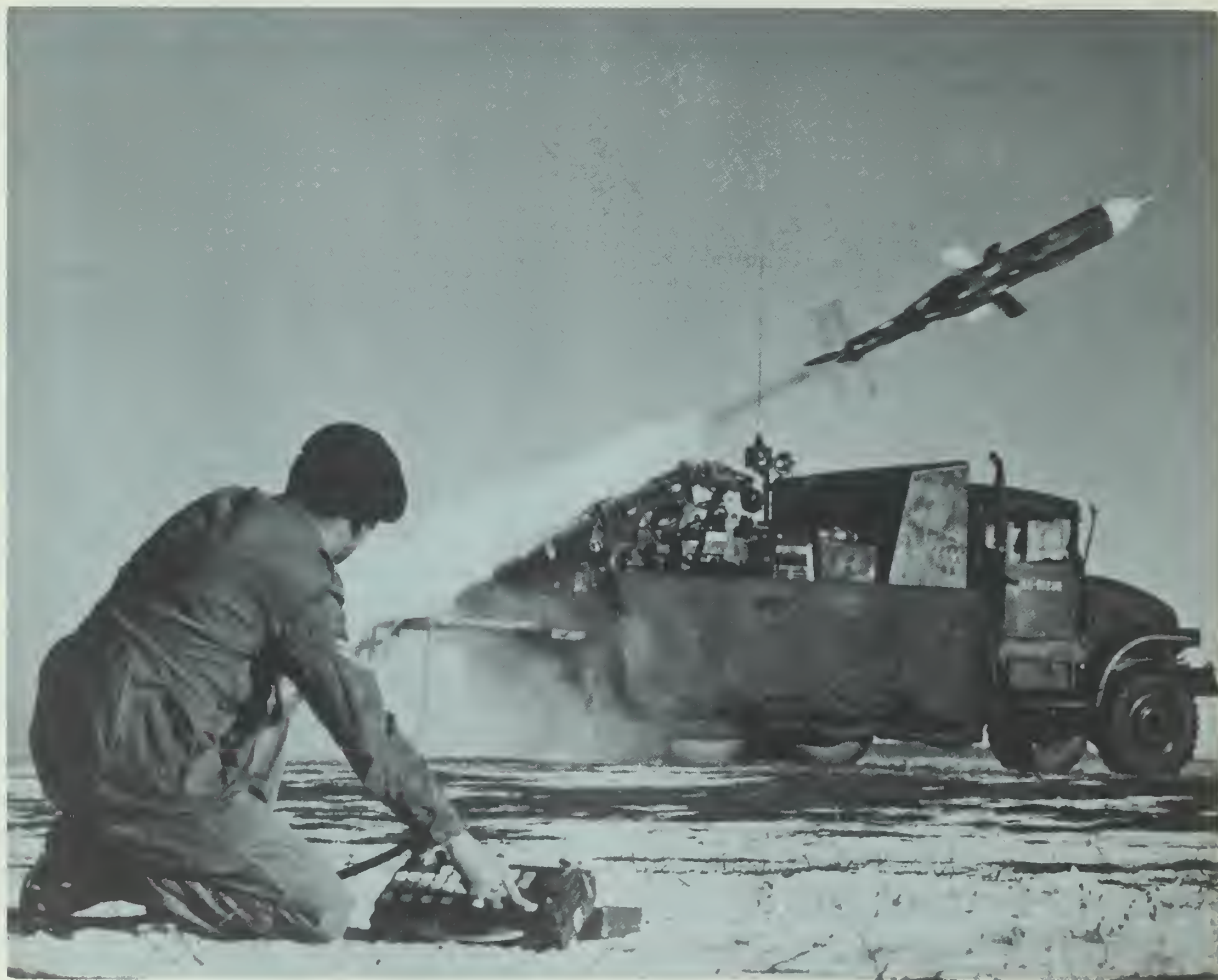
sance, surveillance and target acquisition activities. The capabilities of ground surveillance radars and night observation devices are degraded by heavy rain, snow, sleet, or thick fog. Unattended ground sensors remain effective during periods of adverse weather; but in those situations where airborne relay is required to overcome line-of-sight restrictions for transmission of sensor returns, relay aircraft may not be capable of providing adequate support during instrument meteorological conditions. The Army's present surveillance aircraft, the OV-1 Mohawk is capable of achieving sufficient positional accuracy during instrument meteorological conditions to conduct reconnaissance, surveillance and target acquisition activities, but its on-board sensors are all restricted to some degree by adverse weather.

It is apparent that because of the shortfalls of the various individual sensor equipments, commanders' needs for information can only be met by a total reconnaissance, surveillance and

target acquisition system. This system must be composed of both aerial and ground components, and must provide a necessary and desirable overlap of capabilities by its component equipments. The system must be responsive to the needs of commanders at all echelons.

How will RPVs fit into this reconnaissance, surveillance and target acquisition system; and what capabilities do RPVs offer that cannot be matched or exceeded by manned aircraft—in short, why RPVs?

The current OV-1 Mohawk and its eventual successor, the Manned Aerial Vehicle for Surveillance (MAVS) continue as components of



The Canadair USD-501 may be launched from a palletized assembly adoptable to standard military vehicles.

the Army's aerial surveillance system. RPVs will not obviate the requirement for either the Mohawk or MAVS; but will instead complement manned aircraft. The ability to rapidly adjust to changing situations, and the capacity to exercise judgment when confronted with incomplete or conflicting information regarding the enemy, weather, terrain, and aircraft performance can best be provided by an on-board flight crew. The need for RPVs becomes apparent, however, after consideration of the manner and level of employment of the Mohawk and MAVS.

Both the Mohawk and MAVS are corps echelon systems, and are most responsive to corps and higher echelons. These aircraft will be flown from instrumented airfields located well behind the FEBA and transmit via data link their sensor returns to corps and divisions. Neither the timeliness of response, resolution accuracy of imagery, nor frequency of employment will completely satisfy the information needs of division and lower echelon commanders.

The flexibility of employment provided by manned aircraft cannot be duplicated by RPVs. However, a weight penalty is exacted from manned aircraft, reducing range, endurance, or altitude, since the aircraft must loft the flight crew and their associated life support and environmental control systems.

Another consideration weighing in favor of RPVs is the formidable challenge presented by enemy air defenses. Manned aircraft, as operated at subsonic speeds by the Army, may be incapable of sustaining even limited penetration of the FEBA during future mid/high-intensity conflicts. RPVs can be designed to maneuver at far higher G-forces than tolerable to the crew of a manned aircraft. The typically small size and low radar cross section would make acquisition of a RPV by enemy air defense forces extremely difficult. Thus, RPVs have an inherent advantage over manned aircraft when attempting penetration of enemy airspace. Further, RPVs can be fielded at a fraction of the cost of a manned aircraft employing the same sensors. At anticipated attrition rates, it is foreseeable that multiple launches may be required to obtain mission accomplishment. In terms of manpower and money, RPVs may offer the only acceptable future means of conducting aerial reconnaissance, surveillance and target acquisition activities forward of the FEBA.



The Canadair USD-501 is recovered by parachute, using two air filling landing bags to cushion impact.

RPVs have no unique capabilities which cannot be performed by manned aircraft. They can be designed to perform many of the reconnaissance, surveillance and target acquisition missions now performed by manned aircraft.



# CHARACTERISTICS OF TYPICAL RPV\*

VEHICLE	SPEED	RANGE	PROP SYSTEM	SENSORS	PAYLOAD	GUIDANCE
Lockheed RTV-1 (Prototype)	65-140 kts	@35 km	Internal combustion	Photo, FLIR, or LLTV & laser desig.	110 lbs	Not defined
Lockheed RTV-3 (Proposed)	100-400kts	250 km	Turbojet	Photo, FLIR, or LLTV & laser desig.	110 lbs	Not defined
Canadair USD-501 (Operational)	410 kts	105- 120 km	Rocket booster & turbojet cruise	Photo or IR	33.3 lbs	Programed
Ryan MQM-34D	614 kts	900 n.m.	Turbojet	Target vehicle adaptable to recon.	Over 100 lbs	Remote control
Ryan BQM-34E	Mach 1.5 at 60,000 feet	900 n.m.	Turbojet	Target vehicle adaptable to recon.	Over 100 lbs	Remote control
Northrop MQM-36A	236 mph	205 n.m.	Internal combustion	Target vehicle adaptable to recon.	Not given in unclas sources	Remote control

\*Information extracted from unclassified industry and commercial publications.

Presently available technology permits the design of RPVs capable of carrying a payload composed of all current sensor types. A typical sensor mix might include forward looking infrared (FLIR), or low-light-level television (LLTV); photographic sensors; and possibly a laser target designator. Data link to ground sensor terminals would provide rapid dissemination to ground commanders.

Guidance systems exist which permit RPV flight profiles to be either entirely preprogramed, flown entirely under remote human guidance,




**Four versions of Teledyne Ryan Aeronautical's Model 147 RPV's are poised in front of the C-130 launch aircraft employed by the USAF. Note the RPV mounted at the aircraft wing pylon.**

or the two flight regimes may be mixed within a given mission. A typical RPV mission would see the RPV dispatched on a preprogrammed mission, utilizing a low altitude penetration of the FEBA, with a climb to an appropriate altitude to conduct its reconnaissance activities in the area of interest. When the on-board sensors detect a target that provides a display of acquired imagery to the ground sensor terminal, the remote pilot could then assume control of the mission and fly the RPV in multiple passes over the target area. Upon obtaining sufficient target information, the RPV could be released to continue its programmed mission with a low altitude return penetration of the FEBA.

Launch and recovery techniques now permit the deployment of RPVs from minimally prepared sites. A typical launch is conducted from a vehicle-mounted rail assembly; with recovery by parachute, net, or hover landing (for rotary-

wing or compound design RPVs). This ease of employment, coupled with the inherently low cost of RPVs, are the features which best demonstrate RPVs potential for deployment in support of forward echelons providing the opportunity to overcome line-of-sight restrictions for division and lower echelons.

A number of candidate RPVs are readily available for development; some of which are truly innovative responses to our tactical commanders' need for a low cost, uncomplicated, durable aerial reconnaissance vehicle. RPVs are capable of performing aerial reconnaissance, surveillance and target acquisition activities over broad areas, and under conditions of adverse weather and restricted visibility. When this capability is made available for the support of forward echelons of command, the Army will have bridged its most serious gap in combat intelligence. 



The Arrowhead extends a warm welcome to Major Albert E. Carlson, who will be joining the combat developments team at the Combined Arms Center at Fort Leavenworth, KA.

Major Carlson's assignment to the Combined Arms Center is his first duty assignment since his release from a VC prisoner of war camp. During Major Carlson's second tour of duty in Vietnam, he was serving as an advisor to an ARVN unit in the city of Loc Ninh, which came under enemy attack on 7 April 1972. The city was overrun by the enemy.

The 32 year old native of California is married and has one son. After graduating from San Jose State College and receiving his commission through the ROTC program, Major Carlson served at many CONUS posts. He has seen duty at Fort Dix, NJ; Fort Benning, GA; Fort Sill, OK; and also has served in Europe.

Mrs. Carlson and her son have been residing in Dublin, CA.



## Spot Reports

### CDEC VISITORS

Ft. Ord, Calif. . . . The early part of February has seen a good many "VIP" type visitors at the Army Combat Developments Experimentation Command. Among them the commanding general of the Combat Developments Command, Lt General John Norton. Lt General Norton visited mainly at the Hunter Liggett Military Reservation, CDEC's field laboratory, where he received update briefings from

his host, Brigadier General Ray Ochs, CDEC's commander, and other key officers of the command. He also paid visits to various experimentation sites and held discussions with personnel there. Pictured right, LTG. Norton visits the Experimentation Brigade.

He was accompanied from Fort Belvoir by his Deputy Commander, Major General Curtis Chapman and Command Sergeant Major Hal Hulett who was formerly Command



Sergeant Major of CDEC. CSM Hulett is now Command Sergeant Major of CDC.

During his tour of the field laboratory, General Norton took time to present a Soldier of the Month award to Specialist 4 Joseph Robertson of CDEC's Experimentation Battalion and to attend the National Prayer Breakfast held at the field laboratory.

Also visiting CDEC at the same time were Dr. W. B. Payne, Deputy Undersecretary of the Army to receive a CDEC general orientation; Brigadier General E F Gudgel, commander of the COMS Group, Fort Leavenworth, Kansas; Mr Donald C Gay, Naval Weapons Center, China Lake, California; Lt Colonel Paul Schulz, German Liaison Officer to CDEC Infantry Agency at Fort Benning; Major Milton Howell of CDC Engineer Agency at Fort Belvoir; and from CDC's Systems/AL Group at Fort Lee, the Mssrs John Wood and Dale Anderson.

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## ***Prayer Breakfast***

FT. BELVOIR, VA . . .

Headquarters, Intelligence and Control Systems Group, held its second annual Prayer Breakfast on 1 February 1973. The purpose of the Breakfast was to recognize the moral and spiritual values upon which our nation was founded and to express the faith inherent in the American way of life.

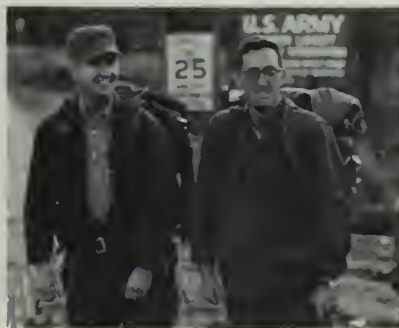
This annual event began in 1952 when members of the Senate and House Prayer Groups established, with President Eisenhower, the first Prayer Breakfast. Since that time, the Breakfast has spread

to hundreds of cities and to over 100,000 personnel on 800 military installations and ships.

The INCS Gp Prayer Breakfast was held in the headquarters conference room for all personnel of the headquarters. The service consisted of prayers and tapes of statements by President Nixon and Secretary of Defense Laird. After the service, coffee and doughnuts were served.

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## ***Tough Traveling***



Ft. Ord, Calif. . . . Three days and 17 hours are all it took for two lieutenants of the Army Combat Developments Experimentation Command to walk from Hunter Liggett Military Reservation, the command's field laboratory, to Fort Ord, through the rugged mountains of the Los Padres National Forest.

Putting their Army training to a demanding test, Infantry Second Lieutenants Kenneth Thompson (above, right) and Eric Spangler (above, left) of Headquarters

and Headquarters Company, Experimentation Brigade, braved the winter elements, slippery and washed out trails and raging rain-swollen streams to do it.

The exercise was part of the Army's Adventure Training Program which places the individual Soldier in stimulating and demanding situations which are a true test of his training and professionalism.

According to Spangler, "Without the Army's training in compass work, map reading and land navigation techniques, we would still be wandering around Los Padres." Emphasizing the difficulty of the task, the men spent the weekends of several preceding months on short hikes, preparing for the Big One.

Because of the unfavorable weather conditions, the CDEC lieutenants were in a hurry to complete the trip and may well have established a record for the trip during winter. Although they invite anyone to try to better their time, the two lieutenants felt that a more leisurely pace should be set to appreciate the rugged beauty of the National Forest.

Except for a short portion of the trip, the hike was done completely on Public land. The best aid on the trip proved to be the excellent terrain maps they obtained from the US Geological Service.

The most exciting portion of the trip came with the crossing of the Carmel River.

As related by Lieutenant Spangler, "The water was five feet deep—with rapids everywhere. There was no place to cross, so we stripped down except for boots and attempted crossing the river. I lost my footing and was barely able



to regain it before being swept downstream. I finally made it across and then Lieutenant Thompson began to cross. Again the current made footing impossible and he was swept downstream about 150 feet before swimming to the other side."

It was too dark to continue on the trail and the wood was too wet to build a fire. Thoroughly soaked after their crossing, the two CDEC officers, as they stated, "ended up getting into sleeping bags and swearing the rest of the night."

The two officers found the hike to be a grueling experience and would only recommend it for experienced hikers. For safety's sake, they recommend that anyone else attempting the trip should do so in a group of at least five or six persons—and during less inclement weather!

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## *Large-Scale Computer*

Ft. Leavenworth, Kan. . . . Lieutenant General John Norton, Combat Developments Command Commander, officially dedicated the new ultra modern Control Data Corporation 6500 Computer System in ribbon cutting ceremonies recently at the Data Processing Field Office (DPFO) facility at Ft. Leavenworth, Kansas.

The computer system is mainly designed to satisfy the automation needs of the Combat Developments Command, but will provide academic support for the Command and General Staff College.

Participating in the dedication ceremonies were Mr. Roger Baldelli, Control Data Corpora-

tion Regional Manager, Mr. Duke Wentworth, Consulting Services Vice President for the Corporation, LTC Gerald Harber, Commander of the DPFO and MAJ Byron Baldwin, Chief of the facility at Ft. Leavenworth.

The 6500 central computer is made up of two high speed central processing units and ten smaller peripheral processors.

Its main memory has a stored capacity of 98,304 sixty-bit words and may be increased to 131,072 in accordance with demands.

Cutting the ribbon were Mr. Herb Braun and Mrs. Marilyn Frame, both of whom have been with the Leavenworth facility of the Data Processing Field Office longer than any other employee.

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Due to the fluctuation of reorganization, the February questions cannot be accurately answered. The correct answers to the February questions will be known only when all planning of the Army reorganization is complete. The *Arrowhead* regrets the subject matter of the February questions, but feels that any answers presented here could not be considered valid at this time.

# Final Issue of Arrowhead: An Editorial

*Arrowhead's* birth, growth and evolution have proved a valuable concept. Communication through a newsletter—family, social, fraternal, professional, or academic—has long had obvious advantages. In the Combat Developments Command, the need for this publication in keeping its members around the world informed as to their diverse activities, interests, objectives, and accomplishments, while unifying esprit de corps, has been essential. This has been our primary aim.

Our growth from a newsletter to a thirty-two page professional magazine has been phenomenal. Articles, serious, amusing, informative, controversial, and stimulating, have been contributed in increasing quantity and quality from all over the Command. The publication of these articles has produced a gratifying response from readers not only within CDC but also in all components of the military, as well as industrial and scientific organizations.

*Arrowhead's* success could not have been achieved without the great effort and cooperation of the many who understand the importance of spreading the message about on-going

efforts to maintain the supremacy of our future Army for the preservation of the free world. Significant have been the contributions of many action officers and information contacts; inspired talent in CDC Graphics Arts Branch; and technical brilliance in photographic coverage through the Fort Belvoir Post Photographic Facility and the Mobility Equipment Research and Development Center. To all who have been involved in any way in the fulfillment of the goals of the *Arrowhead*, the sincere thanks of the editors is offered.

This is *Arrowhead's* final edition. Call it obituary, swan song, or say "ave atque vale." *Arrowhead* has tried to avoid cliché and jargon, but they do creep in, in all professional publications. And *Arrowhead* has become a thoroughly professional monthly, with few peers among military journals. To bring the Soldier of today the big picture in which he has a part in the United States of tomorrow has been the mission of the *Arrowhead*. Mission accomplished; R.I.P.; this is 30 for the *Arrowhead*.

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Command Presentations  
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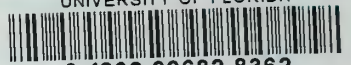
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